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Market and Policy Linkages to African Women's Nutritional and Economic Security

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**Production, Marketing, and Policy Links to African Women's
Nutritional and Economic Security**

**A Case Study of the On-farm Productivity
Enhancement Program(OFPEP)**

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Abstract

This paper describes the On-Farm Productivity Enhancement Program (OFPEP) of Winrock International Institute for Agricultural Development, an activity carried out in collaboration with the Center for PVO/University Collaboration in Development, as a model for effectively addressing the production constraints of small landholder farmers--especially women--in four African countries (Senegal, Uganda, The Gambia/Ethiopia, and Kenya). Results of the work in Senegal, carried out with and through nongovernmental organizations and local extension services, on increased incomes and food security at the household level are presented, and three areas for policy intervention discussed: the approach used in working with farmers, the impact of production technology, agricultural price policy and focus on food crops, and female farmer's access to credit.

Introduction

The On-Farm Productivity Enhancement Program (OFPEP) of Winrock International Institute for Agricultural Development is implemented in collaboration with the Center for PVO/University Collaboration in Development. Field work conducted with and through nongovernmental organizations (NGOs)--both international and indigenous-- and local extension services integrates efforts to improve African male and female farmers' access to viable seeds of improved varieties with activities aimed at increasing soil fertility and improving management. The underlying philosophy of the program is to introduce technologies and practices from which farmers may choose and adapt to suit their circumstances and preferences. OFPEP provides information, training, and links with public and private sources of information, assistance, and material, but OFPEP staff, and the organizations through which it works, do not recommend or promote specific technologies or practices.

The program addresses three of the most pervasive problems of small landholding farmers in Africa: access to seeds, declining soil fertility, and poor market, credit, and input distribution systems. With a high number of female farmers participating in the program, OFPEP targets the lack of access to viable seeds of improved varieties on a timely basis needed for food crops. It works with farmers to improve seed selection, production, and storage practices. To help farmers increase soil fertility, OFPEP establishes networks to assess traditional soil management practices, coordinate demonstrations, distribute inoculum and soil management services, and exchange information on soil management and fertility enhancement techniques. By integrating product and processes, the program addresses marketing and distribution issues while making available sound technical knowledge appropriate to the social, cultural, and educational conditions of the communities in which the program operates.

OFPEP depends on farmer participation for program direction and implementation. The approach builds from the indigenous knowledge base related to soils and soil fertility management in small, sustainable steps. A well-designed monitoring and evaluation system provides feedback throughout project implementation. It involves a three-step process: baseline data collection, periodic monitoring, and evaluation. Participatory Rural Assessment is the primary tool for implementing this system: all OFPEP staff members, collaborating NGO staff members, Peace Corps Volunteers, and extension agents receive PRA training. Baseline data collection (using the simple random method and multi-stage sampling; Anandajayasekeram, 1985) precedes any technical intervention in an area, and also includes a gender analysis. The principles of project implementation relate to lessons learned in previous projects:

- A collaborative approach with local organizations is most effective to reach farmers, especially women.
- A process approach in developing seed-related activities with farmers is more sustainable.

- Follow-up visits reinforce practical training and enhance the farmer's decision making.
- Continuing links with research institutes and sources of technical assistance are necessary..
- Create in-country advisory councils early in project operation.

Funded by USAID (5-year matching grant of USD\$2,999,350) with complementary funding from Monsanto (weed control/soil management, Senegal), COOPIBO (distribution of virus-free improved cassava varieties, Eastern Uganda); and FICAH (program activities, Western Kenya). OFPEP builds on two earlier Winrock programs, the On-Farm Seed Project (Senegal and The Gambia, 1987-1992) and the Biological Nitrogen Fixation/Legume Management Project (Senegal and Uganda, 1989-1992). The program began in 1992 and has received an extra year of funding by the USAID Office of Private and Voluntary Cooperation.

A recent evaluation of the program confirms that OFPEP is responding to real obstacles to increased production by small landholder farmers, with the technologies most in demand that address household food security and income generation. Having involved directly an estimated 150,000 small landholding farmers--primarily women--the program has fostered the empowerment of women by increasing their prestige as agricultural producers through their adoption of introduced production technologies, and by strengthening the capacity of women's groups to plan, implement, and advocate for programs that fit their needs. Conservative estimates based on observation of fields in program areas indicate that the number of farmers using one or more program introductions are in a ratio of three for every one directly participating. Additionally, supportive of research for and advocacy of participatory approaches, because farmers are involved with program planning, implementation, and monitoring, the OFPEP program appears to be sustainable by local NGOs (Zarafonetis, 1997).

Results

The OFPEP program works in four countries (Senegal, Kenya, The Gambia-replaced by Ethiopia in 1995, and Uganda) with more than 60 participating NGOs and farmer groups and has working links with research, technical, and extension institutions and organizations in all four countries. These linkages operate in both directions between and among institutions, NGOs, and farmers, providing opportunities for on-farm testing and research validation on a broad scale. The remainder of this paper will focus on the results from the work in Senegal.

In its tenth year of implementation (beginning with the On-farm Seed Project in 1987), the Senegal program is the oldest OFPEP country activity. Participants in the program have increased steadily; during 1995-96 the program trained more than 700 lead farmers, 427 of these being women. Training is conducted with the NGO collaborators (principally Christian Children's Fund-CCF and U.S. Peace Corps) and has included the following topics: rice, millet, ground nuts, cowpeas, compost, live fencing, soil management/water dikes, soil fertility/inorganic fertilizers/ liming/organic fertilizers and improved farming techniques, soil management/agroforestry, and weed control. The Senegal program results illustrate the effectiveness of the OFPEP approach in working with female farmers (Table 1).

Women

In the Senegal OFPEP-CCF activities, the objective is to produce seed for local seed banks funded by CCF. Depending upon production, each farmer sells a portion of the harvest back to the bank after having taken a portion for consumption and seed for planting next year. The six CCF projects in Senegal have established village seed and cereals banks with harvest from last year's improved millet crop. Table 2 illustrates the amount of production being generated for seed multiplication that ultimately will translate into increased income and food for home consumption.

As women are the traditional farmers in rainfed rice areas, the program targets this crop in the OFPEP/Peace Corps rice activities. Most of the rice production by women is destined for home consumption rather than the market. However, as increased production levels have led to higher incomes and greater participation in market activities (Rugh, 1994; Zarafonetis and Persaud, 1997), two new issues

arise. First, men's increased participation in the program in four traditional rice-growing regions (and in rainfed rice production generally) implies the use of women's labor as individuals or work groups for weeding. Rice plots of men thus implies increased work burdens (weeding/transplanting) for women without knowing how the increased rice production will benefit the family or women.

Second, for women to practice the technique of in-line seeding, they must have access to men's labor and equipment. The seeder and animal traction to pull it are the men's property, and the time for seeding rice fields in this manner coincides with the time when men are seeding peanut fields with the same equipment. The ability to plant in-line is a major challenge for women as it costs approximately USD\$10 per one full day's work to seed 1/2 ha. Assuming that labor for hire is available, women farmers generally consider the returns as worth the extra cost. Assuming a 20% increase in yield from improved varieties and soil management, the increase on .5 ha of rice would be 200 kg. With this yield, a farmer could provide her family with an additional 5 weeks of rice for home consumption (Osborn, 1995).

The OFPEP-CCF villages, dominated by the Sereer ethnic group, are in areas where pressure on land is high and women's roles as independent farmers is marginal. Though OFPEP activities indirectly benefit women as family members who share in the work (weeding, transplanting) of cereals as well as consumption, OFPEP does not directly impact women's income or personal contribution to household grain stocks. As women do not have land ownership rights, the live fencing program--which implies land tenure--is limited to men (Table 1). The project has demonstrated to female farmers the gains obtainable in terms of increased production and savings in time from use of a glyphosate-based herbicide (Roundup Dry). But the lifting of trade restrictions on cheaper imported rice have led to a decline in prices for and sales of locally produced rice.

Income

As a result of Roundup Dry use prior to planting, project field staff reported that in February 1996 farmers increased their production by an average of 21.1% (the equivalent of 552 kg/ha or 69,000 CFA (USD\$138) at the market price of rice paddy of 125F/kg (USD\$.25). Similarly, tests in the Fleuve region proved that the treatment applied at 3.4 kg/ha increased farmer production by 53% or 1500 kg/ha--the equivalent to 187,500 CFA or USD\$375 at the same market value.

Income generated from the live fencing/cassava activity in Baback and Ndollor villages varied from 38,000 CFA (\$76) to 129,380 CFA (\$258) according to the surface area planted with cassava. The study by Ndoeye (1996) on the impact of supplementary revenues indicated that the most common uses of funds are:

- purchase of millet and rice (to cover consumption in households with shortfalls in production);
- non-cereal daily food household expenses;
- purchase of agricultural inputs (seeds and insecticides);
- repair and maintenance of agricultural tools/equipment;
- distribution to neediest members in the community;
- purchase of furniture;
- home construction; and
- school fees/costs of housing students in town;

Food Supply/Nutrition

The strongest evidence of increased food supply as a result of the OFPEP program is illustrated by the in-depth study of Ndoeye (1996) of OFPEP activities in the Baback and Ndollor villages (Tables 3 and 4). Ndoeye's study is based on a sample of 46 randomly selected households from a total of 236 households. Four sociodemographic variables were used to rank the surveyed households (total population per household, active population per household, consumption units per household, dependency ration) and 19 socioeconomic variables (variables of ownership: land availability, number of cattle, number of goats, number of poultry, and agricultural tools). Variables were analyzed using Principal Components Analysis, Hierarchical Descendent Classification and Factorial Discriminatory Analysis to assess the significance of

all analysis performed to establish the boundaries of the ranking and most discriminatory variables. Table 3 illustrates the boundaries of the wealth ranking.

Discussion

OFPEP has addressed the need for seeds and soil fertility management that have been major constraints to food production and food security in Africa. By directly implementing a participatory, demand-driven approach, the program has shown that local NGOs and farmer groups can be mobilized effectively to fill the gap between agricultural research institutions and small landholding farmers. Most significantly, given that the OFPEP staff in all four countries comprise a mixture of genders (as with the collaborating NGOs) a gender-based constraint that can be important in some areas seems to have been bridged through the participatory, demand-driven approach and emphasis on subsistence food crops. This constraint usually is articulated as female farmers are reached most effectively by female extension agents, yet there are few of these to meet the demands of female farmers. The OFPEP success in involving female farmers demonstrates that the approach used to work with farmers on production issues may be more important than the socially constructed relationships that give rise to gender differences. This supports other research findings (Bindlish and Evenson, 1993) that while female extension agents are important to female farmers, productivity increases may not be depend solely on this factor.

OFPEP has helped to increase food security in all four countries by focusing on food crops (rice, sorghum, millet, groundnuts, maize, cowpeas, cassava, wheat, teff, barley, and vegetables). In Senegal, these production increases have raised incomes and increased the number of food-secure months for participating households. However, agricultural policy changes regarding rice have had a negative impact on local prices and reflect the high costs of production as compared to cheaper, lower quality imported rice. This policy change, while important to economic liberalization, negatively affects smaller-scale rice producers--particularly women--from participating in the commercial market. Without greater access to credit, these price disincentives may indeed restrict the ability of female farmers to diversify production of food crops into areas with greater potential to raise income.

Conclusion

The OFPEP program is a time-tested, successful, and sustainable approach to providing farmers--especially female farmers--with technology that directly addresses production constraints, access to seeds, and inputs for soil fertility management. Three policy implications can be drawn from the experience of the program and its impact on female farmers.

First, the approach used to work with farmers is of critical importance. While perhaps harder to mobilize at a national level, the expansion of the program in five years has been remarkable (Rugh, 1994, Zarafonetis and Persaud, 1997), and, relatively speaking, not an expensive program. The program staff clearly have treated farmers as partners in a process-oriented program. This has its limitations--it is slower and less focused than usual intervention models--but it is an approach that is probably more realistic and sustainable given regional diversities and socioeconomic realities. Training and field postings of female extension workers should remain a priority for governments. Investments in PRA training for male and female NGO field staff and public sector extension workers and a demand-driven approach also may have a similar positive impact in diffusion of technologies regarding productivity increases in food crops for female farmers.

OFPEP's success with female farmers may have as much to do with the focus on subsistence food crops as does the demand-driven participatory approach. The program's success has stimulated the West Africa Rice Development Association to jointly implement a program, financed by the International Fund for Agricultural Development (IFAD), to test the OFPEP approach on diffusion of rice technologies in four countries of West Africa. The program's approach, if used for other crops, may or may not have similar positive results.

Second, liberalization of agricultural price policies may have a negative impact on small landholding farmers, especially women, who potentially can produce crops like rice on a commercial basis. Without credit to either lower the costs of production (through investment in more efficient technologies) or to diversify into crops with less competition with imports, it is difficult for farmers to realize income gains beyond a certain point. Access to markets and to information about these markets is needed but presently is beyond the scope of OFPEP. Thus, as productivity gains are achieved among small landholders, investments in market information systems and better physical access to markets need to be made.

Third, while the program has a positive impact at the household level in project areas by increasing the number of food-secure months, without access to credit that would allow for crop diversification or increased yields of the subsistence crops, it is not clear as to how this security translates into food security at a national level. Greater food security at the household level can be construed to result in better nutrition (though nutrition studies have not yet been conducted by the project). Policies that support and provide for microfinance mechanisms for female farmers on an appropriate credit-worthy basis are needed, as well as efforts to focus on nutritional needs once a certain level of food security is reached through traditional food crops.

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Tables

Table 1. Senegal: Percentage of men and women choosing OFPEP-introduced technologies in selected villages, 1996

Collaborator/Activity	# of Choosers	% Women	% Men
Rice	293	94%	6%
Compost	192	1%	99%
Live fencing	284	0	100%
Improved millet	761	0	100%
Improved groundnut	10	20%	80%
Soil Fertility Agroforestry	6	0	0
Weed control/Roundup	16	25%	75%
Dry, Fleuve region			
Weed control/Roundup	24	0	100%
Dry, Anambe region			

Source: OFPEP Fourth Annual Report, Cooperative Agreement No. FAO-0158-A-00-2054-00, USAID October 30, 1996.

Table 2. Illustrative amounts of seeds of improved varieties being multiplied by CCF/OFPEP farmers

Village	Total yield of improved seeds harvested from '96 campaign (kgs)	Seed stored in seed bank distributed for '96 campaign (kgs)	Stock distributed as of 7/96	Number of farmers to receive improved variety seed, '96 campaign	Number of seed multipliers, '96 using 1 kg of seed on 1/4 ha.
Baback	11200	237	237	43	4
Fandene	6923	620	456	226	5
Fissel	5000	713	502	251	2
Thiadiaye	5455	460	150	49	4
Diokhar	8680	871	406	116	15
Ndollar	14282	600	212	66	5
Total	51560	3501	1963	751	30

Source: OFPEP Fourth Annual Report, Cooperative Agreement No. FAO-0158-A-00-2054-00, USAID October 30, 1996.

Table 3. Wealth ranking results, Aifa Ndoye, 1996

Group	# of Households	Average household population	Average available surface area in ha	Average number of herds (cattle, goats, poultry)	Level of agricultural equipment
I	14	13.0		25.8	high
II	9	11.0	5.8	28.7	moderate
III	15	11.4	5.2	18.5	poor
IV	8	10.0	5.9	14.5	very poor

Source: A. Ndoye, 1996. Results are based on a sample of 46 households randomly selected from a total of 236 households surveyed from two Senegalese villages Ndollar and Baback.

Table 4. Food Security: Increase in household food supply with OFPEP-introduced improved millet

Household Wealth Ranking	Months of food supply before OFPEP interventions	Additional months of food security with improved millet program	Total number of Months of food security with OFPEP intervention
I. Richest households	10.5	4.0	14.5
II	8.0	3.5	11.5
III	7.5	3.5	11.0
IV	7.0	3.5	10.5

Source: A. Ndoye, 1996. Results are based on a sample of 46 households randomly selected from a total of 236 households surveyed from two Senegalese villages Ndollar and Baback.